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Scientific Intelligence Report

Trends in Soviet Antisubmarine Warfare (ASW) Capabilities

OSI-SR/SC/65-13
11 October 1965

Directorate of Science and Technology

Office of Scientific Intelligence

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TRENDS IN SOVIET ANTISUBMARINE (ASW) CAPABILITIES

Project Officers

[redacted]

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11 October 1965

Brief

CENTRAL INTELLIGENCE AGENCY
Directorate of Science and Technology
Office of Scientific Intelligence

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TRENDS IN SOVIET ANTISUBMARINE WARFARE (ASW) CAPABILITIES

SUMMARY AND CONCLUSIONS

It is believed that the ASW capability of the Soviet Navy does not constitute a significant threat to U.S. nuclear powered submarines, including on-station Polaris submarines. Despite the modest improvements in weapons, detection systems, and operational tactics which have taken place in recent years, Soviet ASW capabilities against conventional and nuclear submarines in the open seas are virtually nil. Within regional areas of responsibility (coastal waters adjacent to naval bases), the Soviets probably now possess the capability to conduct effective ASW operations against conventionally powered submarines. Against nuclear submarines in coastal waters, the capability remains very poor. The inability of the Soviets to effect initial detection of submarines, particularly in open ocean areas, remains their primary problem.

The USSR almost certainly will endeavor to improve its ASW capabilities by the development of improved sonar and more effective weapons for surface ships, submarines, and aircraft.

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A very great and unprecedented expansion, both qualitative and quantitative, of Soviet naval forces would have to take place in order for the Soviets to be able to conduct effective ASW operations in open ocean areas. However, there is no evidence that such an expansion is impending or planned. Accordingly, it is believed that the Soviets will have only a limited capability to detect, identify, localize, maintain surveillance, and destroy submarines operating in the open seas over the next five years.

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DISCUSSION

General

Since the late 1950's, the Soviets have made an effort to improve the capabilities of their ASW forces through the introduction of new ships, weapons, and detection devices. New classes of ships include the Krupnyy, Kynda, and Kashin guided missile destroyer types which have ASW as part of their mission; Petya and Mirka ASW escorts; Poti-class subchasers; and the R, F, and N-class submarines which have a potential for ASW. New weapons introduced include the MBU 2500 to 4500 series ASW rocket launchers and the ET-80A torpedo. New detection devices include active scanning sonar and experimental submarine passive listening arrays of large size. Aircraft configured for ASW include the

land-based MI-4 helicopter and the BE-6 seaplane. Increasing use is being made of naval TU-16s; the new turboprop seaplane BE-12 has been developed; and an ASW version of the IL-18 may be introduced.

Detection Systems

Surface Ship Sonar

Active sonar systems presently in use do not appear to be particularly advanced. Operating frequencies that have been identified are 14-16 Kcs, 17-22 Kcs, and 24-30 Kcs. Most of these are searchlight sonars, but it is believed that the most recent destroyers are equipped with

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Some Soviet fishing trawlers have been equipped with relatively high power sonar sets for fish finding. While a trawler has serious limitations as a sonar platform, these fish-finding sonars may be used as an early warning system against targets of chance encounter.

Submarine Sonars

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Hydroacoustic Shore-Based Systems

Present Soviet shore-based hydroacoustic equipment consists mainly of short range harbor defense equipment, both passive and active. The estimated range of the passive shore-based harbor defense system is approximately 12 nautical miles (nm) against a noisy target, while the searchlight active system is estimated to have a maximum range capability of about 5 miles under good sonar conditions.

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Sonobuoys

The detection range for the standard air-dropped sonobuoy, which is large and heavy, is probably less than three miles against a noisy target.

* See SID/SC/65-7, July 1965, TOP SECRET CODEWORD.

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A smaller size operational sonobuoy, which evidently has been in serial production since at least 1964, was recovered recently. The new small buoy has the same operational capability as the older and larger one. It will permit an ASW aircraft to carry approximately three times as many sonobuoys, and constitutes a significant improvement. The new buoy will undoubtedly become the standard Soviet sonobuoy in the near future. Sonobuoys using fully transistorized circuitry, having longer life and greater detection ranges, could be operational by 1970.

Moored Sonobuoys

The Soviets have installed the large standard sonobuoy's electronics and hydrophone in a variety of large containers (often mine cases). These are emplaced by ships and are usually moored. In some instances, the life of these buoys, which have large battery capacity, is as long as 36 days. A new, large, long-life, moored passive buoy with a directional hydrophone is now in operational use. Its relatively high operating frequency probably limits its detection range, however.

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Magnetic Detection Devices

The Soviets have installed magnetic detection devices on ASW aircraft. The range of effectiveness is estimated to be 600 to 900 feet (total air and water path). By 1970, these ranges could be somewhat improved. Nevertheless, the extremely short range of such devices precludes their use for area search and limits their application to localizing the position of a submarine whose approximate position has been established by other means.

Other Non-Acoustic Detection Systems

The Soviets are conducting basic research on the nuclear-radiation, infrared- and visible-optical, electromagnetic, hydrodynamic, and surface-film phenomena of the ocean that may be applicable to the detection of submerged submarines. There is no evidence, however, that this research has reached the stage at which a practical detection system could be developed. No experimentation at sea involving these phenomena in conjunction with submarines has been noted.

Weapons

ASW Rockets

Soviet long range ASW rocket weapons consist of the MBU series of ASW rocket launchers. The latest versions are loaded automatically. Some Kashin-class destroyers are fitted with six-barrelled MBU-4500A rocket launchers. The rockets have a 5,000 yard range, magnetic influence/contact fuzes and

can be reloaded in 45 seconds. Some of the other destroyers and ocean going escorts are fitted with 12-barrelled MBU-2500A launchers, having 2,500 yards range, magnetic-influence/contact fuzes, and can be reloaded in 90 seconds. Backfitting of some version of the MBU series on all ASW units not so equipped is under way. These rockets would not be very effective, however, against high speed submarines.

To develop truly advanced ASW weapon systems would be a major effort for the Soviets. Even with the highest priority, it is not believed that the Soviets could develop an ASROC/IRARA-type ASW rocket, together with the long range sonar required, before 1968 at the earliest.

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Torpedoes

The only operational ASW torpedo known to be available to the Soviet fleet is the ET-80A passive acoustic homing torpedo, which became operational in 1962. It can attack cavitating submarines to a depth of 750 feet and has a speed of 23 knots for a maximum range of about 12,000 yards. Because its homing system is passive, this torpedo is not effective against quiet submarines. It is also too slow to hit submarines proceeding at speeds greater than 20 knots.

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Mines

The Soviets are capable of using submarines to carry out extensive, undetected mining operations in areas remote from the USSR. The Soviets now have a

moored contact mine, with antennas which can effectively mine from the surface down to 260 feet in waters as deep as 1,500 feet. Existing influence mines are effective in waters less than 180 feet deep. By 1970 it is expected that the Soviets will have a moored, contact-firing mine, with antennas which can effectively mine from the surface to 350 feet in water depths up to 2,000 feet.